

REMARKS

Claims 1-11 were examined in the Office Action mailed April 1, 2008.

The following objections and rejections are currently pending:

- Objection to the drawings for use of the reference label “18” for both a transmission and a clutch, and for use of the reference label “22” for both vehicle wheels and a secondary unit.
- Rejection of claims 1-11 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,615,940 to Morisawa (“Morisawa”) in view European Patent No. EP 1 286 405 to Kinya (“Kinya”).

1. **The Drawing Objections Have Been Addressed.** The Applicant is requesting Examiner approval of proposed amendments to the figures, as shown on the enclosed Replacement sheet, as well as corresponding amendments to the Specification, to change the reference character for the first clutch to “19,” and to change the reference label for the “additional vehicle wheels” to “23.”

2. **The Claims Are Patentable Over Morisawa § 103(a).** The Applicant respectfully traverses the rejection of claims 1-11 under § 103(a) as unpatentable over Morisawa in view of Kinya, on the grounds that these references do not teach or suggest all of the features of the present invention for which they are cited.

The Present Invention. The present invention is directed to a novel application of a fuel cell in a vehicle, wherein a fuel cell with a power output lower than an engine is operated at all times at its peak efficiency, supplying power to at least one power consuming device and supplying any excess power (resulting from being operating at the point of peak efficiency) to at least one additional power consuming device. In the apparatus recited in claim 1, the

controller provided is programmed to control the fuel cell and to distribute any excess power as required to maintain the fuel cell within a predetermined operating range corresponding to peak efficiency.

The Cited References. The Morisawa reference is a system for providing traction control to wheels driven by power from a fuel cell. Morisawa Abstract. As a threshold matter, the Morisawa fuel cell is not the recited “auxiliary power source” (as that term is used by the inventor in the present disclosure, providing power to auxiliary devices of the vehicle) but is a propulsion power source, powering a motor generator driving the rear wheels.

In the pending Office Action, Morisawa is acknowledged to not disclose operation of its fuel cell at a constant output (let alone being operated at a constant output corresponding to peak efficiency, with any excess power being supplied to an additional power consuming device so that fuel cell power output (and thus peak efficiency) can be maintained). April 1, 2008 Office Action at 4. This is consistent with Morisawa’s disclosure, which teaches that the Morisawa system provides traction control by *decreasing the amount of power delivered from the fuel cell* to the rear wheels via motor generator 2 (“MG2”). *Id.* at 2:3-10; Fig. 5 (steps SA20, SA22). In other words, Morisawa teaches that its fuel cell is *not* to be operated at a constant output (*i.e.*, the fuel cell output *must* be decreased to provide the desired traction control function).

The Kinya reference is cited as disclosing this feature of the present invention, however, this is not the case, and in any event this reference cannot be combined Morisawa, for the reasons discussed below.

As a first matter, Kinya is cited as disclosing (i) a fuel cell which operates in an operating range, (ii) the operating range is at or near the maximum efficiency, and (ii) the fuel cell is used to power a navigation system. April 1, 2008 Office Action at 4. The Applicant respectfully notes that the pending claims do not merely recite that the fuel cell operates within a predetermined range.

Claim 1 specifically recites (i) that the control unit “controls the operation of the fuel cell system *to operate continuously in* a predetermined operating range or at a predetermined operating point of a high efficiency,” and (ii) that as part of maintaining the continuous fuel cell power output in the range of peak fuel cell efficiency, the fuel cell power is “supplied at least to one power consuming device and any excess power of the fuel cell system being supplied to at least one additional power consuming device *as required to maintain high fuel cell system efficiency*” – in other words, the entire system of fuel cell power supply and power consuming devices are coordinated such that there is no need to vary the output of the fuel cell.

Kinya teaches exactly the *opposite* of the present invention, and thus would not be obvious to combine with Morisawa. The stated objective of Kinya is to *maximize* the *responsiveness* of the fuel cell to changes in output demand. Kinya Abstract (“A target output value for the fuel cell is set within a range *such that the fuel cell output can track change in power demand.*” (emphasis added)); *see also* ¶ [0010] (“According to the present invention, a target output value for the fuel cell is set within a range not to exceed a certain predetermined value determined on the basis of output *responsiveness* of the fuel cell, in other words,

a range within which fuel cell output can track the change in power demand."

(emphasis added)). Indeed, rather than containing any suggestion of the invention recited in pending claim 1, Kinya teaches *avoiding* generation of excess power from the fuel cell – the *opposite* of intentionally allowing excess generation in order to maintain fuel cell output in the peak efficiency range, as in the present invention: "As a result, excessive charge or discharge of the storage portion can be minimized while at the same time outputting power in a highly responsive manner." Kinya ¶ [0011].¹

Thus, one of ordinary skill in the art, considering Morisawa and Kinya would find:

- Morisawa teaching a system in which there is no teaching of an auxiliary power consumption device (the Morisawa fuel cell providing power to the rear wheels);
- Morisawa teaching a system which *requires* the fuel cell output to be decreased in order to execute the traction control feature of the system;
- Kinya teaching a fuel cell system designed to ensure the *maximum* ability of the fuel cell to change its power output level;
- Kinya containing absolutely no reference to, or suggestion of, maintaining

¹ Kinya ¶ [0011] is cited in the Office Action, apparently for the implication that Kinya teaches a near constant fuel cell output in a predetermined range at or near the fuel cell's peak operating efficiency point. The Applicant respectfully submits that the mere fact that Kinya discusses operating the fuel cell in "a predetermined range" does not provide any teaching or suggestion for operation focused or centered on operating at/near the peak efficiency operating point. To the contrary, one of ordinary skill in the art reading the Kinya disclosure in its entirety would recognize that in order to follow power demand in the responsive manner desired by Kinya, the fuel cell would have to frequently be operated *away* from the peak efficiency point. Thus, the assumption in the present Office Action that the range discussed in Kinya must be at or near the fuel cell's peak efficiency operating point is not (and cannot be) supported.

fuel cell output at or near a constant level in order to maintain the fuel cell at peak efficiency.²

Accordingly, one of ordinary skill would not consider these references in attempting to arrive at the invention recited in pending claim 1 because: (i) *both* references teach *varying* fuel cell output to follow load, not maintaining the fuel cell at peak efficiency and absorbing any excess power output elsewhere in the system; and (ii) even if there were any suggestion in Kinya to operate the Morisawa system with the fuel cell maintained at or near peak efficiency, such a combination would not be considered because, per MPEP § 2144.02.VI, it would “change the principle of operation of” Morisawa (*i.e.*, prevent Morisawa’s decreasing of fuel cell output to provide traction control).

Because one of ordinary skill in the art would have found no suggestion or motivation to combine the Morisawa and Kinya references, and in any event no combination of these references would result in the claim 1 apparatus in which “a control unit controls the operation of the fuel cell system to operate continuously in a predetermined operating range or at a predetermined operating point of a high efficiency, with the power the fuel cell system delivers being supplied at least to one power consuming device and any excess power of the fuel cell system being supplied to at least one additional power consuming

² The pending Office Action cites to Kinya ¶ [0112] as disclosing an alternative embodiment in which the fuel cell powers a navigation system. To the extent this reference is cited to imply that Kinya teaches constant power output at or near peak efficiency, the Applicant respectfully submits that this is simply not the case. Paragraph [0112] follows a portion of the Kinya specification which discusses maintaining high load-responsiveness of the fuel cell, and this paragraph simply states that the navigation system can be supplied with power in a stable manner “*while ensuring output responsiveness [of fuel cell 60] to the degree of acceleration [i.e., supply of the navigation system is possible while the fuel cell continues to follow the variable load demand of the vehicle].*”

device as required to maintain high fuel cell system efficiency," claims 1-11 are patentable over Morisawa and Kinya under § 103(a). Accordingly, reconsideration and withdrawal of the pending § 103(a) rejection based on these references is respectfully requested.

CONCLUSION

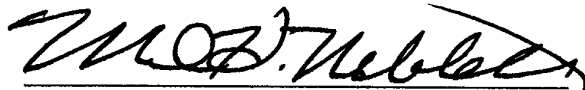
The Applicant respectfully submits that claims 1-11 are in condition for allowance. Early and favorable consideration and issuance of a Notice of Allowance for these claims is respectfully requested.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #095309.55683US).

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